

## CLAIMS

What is claimed is:

1           1. A structure comprising:  
2           a plurality of electrically conducting beam leads in an  
3           array on an electronic chip carrier of a TAB package;  
4           said beam leads being electrically and mechanically  
5           joined to bonding pedestals or bumps by an electrically  
6           conducting adhesive.

1           2. A structure according to Claim 1, wherein the said  
2           conducting beam leads are made of a material selected from  
3           the group consisting of copper, Sn-plated surface, Au-plated  
4           surface, Au/Ni-plated surface and wherein the said  
5           conducting beam leads are supported by an insulating polymer  
6           selected from the group consisting of polyimide and  
7           polyester.

1           3. A structure according to Claim 1, wherein the said  
2           electrically conducting adhesive comprises:  
3           a thermoplastic or thermoset polymer resin matrix,  
4           no-clean solder flux,  
5           a plurality of electrically conducting particles with  
6           an electrically conducting fusible coating with at least  
7           some of said particles being fused to other said particles  
8           through said electrically conductive fusible coating.

1           4. A structure according to Claim 3, wherein said  
2           electrically conducting particles are formed from at least  
3           one material selected from the group consisting of Cu, Au,  
4           Ag, Al, Pd and Pt.

1 5. A structure according to Claim 3, wherein said  
2 electrical coating is selected from the group consisting of  
3 Sn, Zn, In, Pb, Bi and Sb, and combinations thereof.

1 6. A structure according to Claim 3, wherein said  
2 polymeric material is selected from the group consisting of  
3 polyimide, siloxane, polyimide-siloxane, phenoxy polymers,  
4 styrene allyl alcohol polymers, epoxies and bio-based  
5 polymeric resins derived from at least one member selected  
6 from the group consisting of lignin, cellulose, wood oil and  
7 crop oil.

1 7. A structure according to Claim 3, wherein said  
2 polymeric material provides adhesive joining of said bonding  
3 pedestals or bumps.

1 8. A structure according to Claim 3, wherein said  
2 conducting particles are about 1 to about 50 micrometers in  
3 diameter.

1 9. The structure according to Claim 3, wherein said  
2 fusible coating is about 0.1 to about 2 micrometers in  
3 thickness.

1 10. A structure according to Claim 1, wherein said  
2 structure is an electronic device.

1 11. A structure according to Claim 1, wherein said  
2 structure is a computing device.

1 12. A structure according to Claim 1, wherein said  
2 structure is an electronic chip carrier of a tape automated  
3 bonding (TAB) package.

1 13. A structure according to Claim 1, wherein the  
2 attachment of the said beam leads with the said conducting  
3 adhesive is achieved by applying heat and pressure for a  
4 duration of time.

1 14. A structure according to Claim 1, wherein the  
2 disposition of the said conducting adhesive is achieved by  
3 use of a syringe to the tip area of the said beam leads.

1 15. A structure according to Claim 1, wherein the  
2 disposition of the said conducting adhesive is achieved by  
3 use of a syringe, screen or stencil print to the top of the  
4 said bonding pedestals or bumps on an integrated circuit  
5 device.

1 16. A structure comprising:  
2 a plurality of electrically conducting bumps in an  
3 array on an integrated circuit device for a flip chip  
4 interconnection;  
5 said bumps being electrically and mechanically joined  
6 to terminal pads on an electronic chip carrier module by an  
7 electrically conducting adhesive;  
8 said electrically conducting adhesive being deposited  
9 either on the said terminal pads of the said chip carrier  
10 module or on the said conducting bumps on the said  
11 integrated circuit device.

1 17. A structure according to Claim 16, wherein the  
2 said conducting bumps are made from metals selected from the  
3 group consisting of Au, Cu, Ni, Co, Ag, Pd, Pt, Pb, Sn, In,  
4 Bi, Sb, Sn, and alloys thereof.

1 18. A structure according to Claim 16, wherein the  
2 said conducting bumps are deposited on the thin film layers  
3 selected from the group consisting of Cr/Cu/Au or Ti/Cu/Au  
4 and TiW/Cu/Au, and wherein the said thin film layers are  
5 deposited on aluminum or copper metallization of an  
6 integrated circuit device.

1 19. A structure according to Claim 16, wherein the  
2 said electrically conducting adhesive comprises:  
3 a thermoplastic or thermoset polymer resin matrix,  
4 no-clean solder flux,  
5 a plurality of electrically conducting particles with  
6 an electrically conducting fusible coating with at least  
7 some of said particles being fused to other said particles  
8 through said electrically conductive fusible coating.

1 20. A structure according to Claim 19, wherein said  
2 electrically conducting particles are formed from at least  
3 one material selected from the group consisting of Cu, Au,  
4 Ag, Al, Pd and Pt.

1 21. A structure according to Claim 19, wherein said  
2 electrical coating is selected from the group consisting of  
3 Sn, Zn, In, Pb, Bi and Sb, and combinations thereof.

1 22. A structure according to Claim 19, wherein said  
2 polymeric material is selected from the group consisting of  
3 polyimide, siloxane, polyimide-siloxane, phenoxy polymers,  
4 styrene allyl alcohol polymers, epoxies and bio-based  
5 polymeric resins derived from at least one member selected  
6 from the group consisting of lignin, cellulose, wood oil and  
7 crop oil.

1 23. A structure according to Claim 19, wherein said  
2 polymeric material provides adhesive joining of said solder  
3 bumps.

1 24. A structure according to Claim 19, wherein said  
2 conducting particles are about 1 to about 50 micrometers in  
3 diameter.

1 25. A structure according to Claim 19, wherein said  
2 fusible coating layer is about 0.1 to about 2 micrometers in  
3 thickness.

1 26. A structure according to Claim 16, wherein said  
2 structure is an electronic device.

1 27. A structure according to Claim 16, wherein said  
2 structure is a computing device.

1 28. A structure according to Claim 16, wherein said  
2 structure is an electronic chip carrier of a flip chip  
3 package.

1 29. A structure according to Claim 16, wherein the  
2 attachment of the said solder bumps to the said electronic  
3 module with the said conducting adhesive is achieved by the  
4 application of heat and pressure for a duration of time.

1 30. A structure according to Claim 16, wherein the  
2 disposition of the said conducting adhesive is achieved to  
3 the said terminal pads of an electronic module by use of a  
4 syringe or screen print.

1           31. A structure according to Claim 16, wherein the  
2 disposition of the said conducting adhesive is achieved to  
3 the top of the said solder bumps on an integrated circuit  
4 device by use of a syringe or screen print.

1           32. A structure comprising:  
2           a plurality of electrically conducting beam leads in an  
3 array on an electronic chip carrier of a TAB package used  
4 for electrically connecting between an active matrix liquid  
5 crystal display (AMLCD) and a printed circuit board;  
6           said beam leads being electrically and mechanically  
7 joined to the electrodes on an AMLCD glass plate by means of  
8 an electrically conducting adhesive;  
9           said electrically conducting adhesive being deposited  
10 either on the said electrode pads of the said glass plate or  
11 on the said conducting beam leads of a TAB package.

1           33. A structure according to Claim 32, wherein the  
2 said conducting beam leads are made of a material selected  
3 from the group consisting of copper, Sn-plated surface, Au-  
4 plated surface, Au/Ni-plated surface and wherein the said  
5 conducting beam leads are supported by an insulating polymer  
6 selected from the group consisting of polyimide and  
7 polyester.

1           34. A structure according to Claim 32, wherein the  
2 said electrically conducting adhesive comprises:  
3           a thermoplastic or thermoset polymer resin matrix,  
4           no-clean solder flux,  
5           a plurality of electrically conducting particles with  
6 an electrically conducting fusible coating with at least  
7 some of said particles being fused to other said particles  
8 through said electrically conductive fusible coating.

1 35. A structure according to Claim 34, wherein said  
2 electrically conducting particles are formed from at least  
3 one material selected from the group consisting of Cu, Au,  
4 Ag, Al, Pd, Pt, and plastic balls coated with at least one  
5 member selected from the group consisting of Ni, Co, Cu, Au,  
6 Ag, Pt, Pd and combinations thereof.

1 36. A structure according to Claim 34, wherein said  
2 fusible coating is selected from the group consisting of Sn,  
3 Zn, In, Pb, Bi and Sb, and combinations thereof.

1 37. A structure according to Claim 34 wherein said  
2 polymeric material is selected from the group consisting of  
3 polyimide, siloxane, polyimide-siloxane, phenoxy polymers,  
4 styrene allyl alcohol polymers, epoxies and bio-based  
5 polymeric resins derived from the group consisting of at  
6 least one member selected from lignin, cellulose, wood oil  
7 and crop oil.

1 38. A structure according to Claim 34, wherein said  
2 polymeric material provides adhesive joining of said bonding  
3 pedestals or bumps.

1 39. A structure according to Claim 34, wherein said  
2 conducting particles are about 1 to about 50 micrometers in  
3 diameter.

1 40. A structure according to Claim 34, wherein said  
2 fusible coating layer is about 0.1 to about 2 micrometers in  
3 thickness.

1 41. A structure according to Claim 32, wherein said  
2 structure is an electronic device.

1           42. A structure according to Claim 32, wherein said  
2 structure is a computing device.

1           43. A structure according to Claim 32, wherein said  
2 structure is an electronic chip carrier of a tape automated  
3 bonding (TAB) package used for electronic packaging of an  
4 active matrix liquid crystal display (AMLCD).

1           44. A structure according to Claim 32, wherein the  
2 attachment of the said beam leads with the said conducting  
3 adhesive is achieved by the application of heat and pressure  
4 for a duration of time.

1           45. A structure according to Claim 32, wherein the  
2 disposition of the said conducting adhesive is achieved by  
3 use of a syringe to the tip area of the said beam leads.

1           46. A structure according to Claim 32, wherein the  
2 disposition of the said conducting adhesive is achieved by  
3 use of a syringe, screen or stencil print to the said  
4 electrode pads on an AMLCD glass plate.